

Figs 355, 364

pp 172, 178, 179

-- 79. A device for the working of fluids, said device comprising a cylinder assembly, at least one component mounted to reciprocate within said cylinder assembly and means deployed between said cylinder assembly and said reciprocating component to cause said component to rotate while reciprocating, said cylinder assembly having at least one cylinder segment defining an end, said component and segment having working surfaces that in operation define at least one fluid working chamber of cyclically variable capacity, said component defining a passage for fluids worked by said device.

-- 80. A device for the working of fluids, said device comprising a cylinder assembly, at least one component mounted to reciprocate within said cylinder assembly and means deployed between said cylinder assembly and said reciprocating component to cause said component to rotate while reciprocating, said cylinder assembly having at least one cylinder segment defining an end, said component and segment having working surfaces that in operation define at least one fluid working chamber of cyclically variable capacity, said device including structure surrounding said assembly which defines a volume at least partially surrounding said assembly and defining a passage for fluids worked by said device. --

-- 81. A device for the working of fluids, said device comprising a cylinder assembly, at least one component mounted to reciprocate within said cylinder assembly and means deployed between said cylinder assembly and said reciprocating component to cause said component to rotate while reciprocating, said cylinder assembly having at least one cylinder segment defining an end, said component and segment having working surfaces that

I

in operation define at least one fluid working chamber of cyclically variable capacity, said device including a housing, said housing having a plurality of means mounted between said housing and said cylinder assembly to permit said cylinder assembly to freely rotate relative to said housing. --

FIGS 390, 391

pp 186, 187

-- 82. A device for the working of fluids, said device comprising a cylinder assembly and at least one component mounted to move within said cylinder assembly, said cylinder assembly and component defining complementary surfaces at least partly of endless wave-like configurations to permit said component to both rotate and reciprocate relative to said cylinder assembly, said cylinder assembly having at least one cylinder segment defining an end, said component and segment having working surfaces that in operation define at least one fluid working chamber of cyclically variable capacity. --

FIG 397

p 191

-- 83. The device of claim 82, including a housing and means mounted between said housing and said cylinder assembly to permit free rotation of said cylinder assembly relative to said housing. --

FIG 390

p 186

-- 84. The device of claim 82, wherein said component defines a projecting portion which pierces said end during at least part of a cyclical operation. --

FIG 355

p 172

-- 85. The device of claim 82, wherein said component defines a passage for fluids worked by said device. --

FIG 357

p 172

-- 86. The device of claim 82, including structure surrounding said assembly which defines a volume at least partially surrounding said assembly and defining a passage for fluids worked by said device. --

Figs 29-65

-- 87. The device of claim 79, including filamentary material within said passage. --

-- 88. The device of claim 85, including filamentary material within said passage. --

-- 89. The device of claim 80, including filamentary material within said volume. --

-- 90. The device of claim 86, including filamentary material within said volume. --

Figs 371, 372

pp 180, 181

-- 91. The device of claim 78, wherein said component defines a hollow portion with interior splines, said shaft being positioned within said hollow portion with exterior splines and meshing with said interior splines to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 92. The device of claim 79, wherein said component defines a hollow portion with interior splines and including a shaft positioned within said hollow portion with exterior splines and meshing with said interior splines to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 93. The device of claim 80, wherein said component defines a hollow portion with interior splines and including a shaft positioned within said hollow portion with exterior splines meshing with said interior splines to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 94. The device of claim 81, wherein said component defines a hollow portion with interior splines and including a shaft positioned within said hollow portion with exterior splines meshing with said interior splines to permit rotation of said shaft while said component is reciprocating and rotating. --

FIG 371, 372

pp 180, 181

-- 95. The device of claim 82, wherein said component defines a hollow portion with interior splines and including a shaft positioned within said hollow portion with exterior splines meshing with said interior splines to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 96. The device of claim 83, wherein said component defines a hollow portion with interior splines and including a shaft positioned within said hollow portion with exterior splines meshing with said interior splines to permit rotation of said shaft while said component is reciprocating and rotating. --

FIGS 371, 372

pp 180, 181

-- 97. The device of claim 78, wherein said component defines a hollow portion with radial circumferential flanges and including rollers mounted on said flanges, said shaft having radial circumferentially spaced longitudinal flanges and including rollers mounted on said shaft flanges, said shaft being mounted within said hollow portion to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 98. The device of claim 79, wherein said component defines a hollow portion with radial circumferential flanges and including rollers mounted on said flanges and including a shaft with radial circumferentially spaced longitudinal flanges and including rollers mounted on said shaft flanges, said shaft being mounted within said hollow portion to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 99. The device of claim 80, wherein said component defines a hollow portion with radial circumferential flanges and including rollers mounted on said flanges and including a shaft with radial circumferentially spaced longitudinal flanges and including rollers mounted on said shaft flanges, said shaft being

mounted within said hollow portion to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 100. The device of claim 81, wherein said component defines a hollow portion with radial circumferential flanges and including rollers mounted on said flanges and including a shaft with radial circumferentially spaced longitudinal flanges and including rollers mounted on said shaft flanges, said shaft being mounted within said hollow portion to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 101. The device of claim 82, wherein said component defines a hollow portion with radial circumferential flanges and including rollers mounted on said flanges and including a shaft with radial circumferentially spaced longitudinal flanges and including rollers mounted on said shaft flanges, said shaft being mounted within said hollow portion to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 102. The device of claim 83, wherein said component defines a hollow portion with radial circumferential flanges and including rollers mounted on said flanges and including a shaft with radial circumferentially spaced longitudinal flanges and including rollers mounted on said shaft flanges, said shaft being mounted within said hollow portion to permit rotation of said shaft while said component is reciprocating and rotating. --

F165 375, 376

pp182, 181

-- 103. The device of claim 78, including a bellows mechanism, said bellows mechanism fixedly attaching said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 104. The device of claim 79, including a shaft and bellows mechanism, said bellows mechanism interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 105. The device of claim 80, including a shaft and bellows mechanism, said bellows mechanism interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 106. The device of claim 81, including a shaft and bellows mechanism, said bellows mechanism interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 107. The device of claim 82, including a shaft and bellows mechanism, said bellows mechanism interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 108. The device of claim 83, including a shaft and bellows mechanism, said bellows mechanism interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

Figs 373, 374

pp 181, 182

-- 109. The device of claim 78, including a shaft and at least one hinged element, said hinged element interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 110. The device of claim 79, including a shaft and at least one hinged element, said hinged element interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 111. The device of claim 80, including a shaft and at least one hinged element, said hinged element interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 112. The device of claim 81, including a shaft and at least one hinged element, said hinged element interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 113. The device of claim 82, including a shaft and at least one hinged element, said hinged element interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

-- 114. The device of claim 83, including a shaft and at least one hinged element, said hinged element interconnecting said component and shaft to permit rotation of said shaft while said component is reciprocating and rotating. --

FIGS 375, 376

p 182

-- 115. The device of claim 78, including a linking mechanism, said linking mechanism transferring work between said component and said shaft, said linking mechanism comprising a pump. --

-- 116. The device of claim 79, including a rotatable shaft and a linking mechanism, said linking mechanism transferring work between said component and said shaft, said linking mechanism comprising a pump. --

-- 117. The device of claim 80, including a rotatable shaft and a linking mechanism, said linking mechanism transferring work between said component and said shaft, said linking mechanism comprising a pump. --

-- 118. The device of claim 81, including a rotatable shaft and a linking mechanism, said linking mechanism transferring work between said component and said shaft, said linking mechanism comprising a pump. --

-- 119. The device of claim 82, including a rotatable shaft and a linking mechanism, said linking mechanism transferring work between said component and said shaft, said linking mechanism comprising a pump. --

-- 120. The device of claim 83, including a rotatable shaft and a linking mechanism, said linking mechanism transferring work between said component and said shaft, said linking mechanism comprising a pump. --

p103 -- 121. The device of claim 78 defining a pump. --

-- 122. The device of claim 79 defining a pump. --

-- 123. The device of claim 80 defining a pump. --

-- 124. The device of claim 81 defining a pump. --

-- 125. The device of claim 82 defining a pump. --

-- 126. The device of claim 83 defining a pump. --

-- 127. The device of claim 84 defining a pump. --

-- 128. The device of claim 85 defining a pump. --

-- 129. The device of claim 86 defining a pump. --

pp 87-92 -- 130. The device of claim 81, wherein said housing comprises insulating material. --

pp 87-92 -- 131. The device of claim 83, wherein said housing comprises insulating material. --

pp 87-92 -- 132. The device of claim 78, including insulating material, said device partially encased therein. --

-- 133. The device of claim 79, including insulating material, said device being at least partially encased therein.--

-- 134. The device of claim 80, including insulating material, said device being at least partially encased therein.--

-- 135. The device of claim 82, including insulating material, said device being at least partially encased therein.--

-- 136. The device of claim 84, including insulating material, said device being at least partially encased therein.--

-- 137. The device of claim 85, including insulating material, said device being at least partially encased therein.--

-- 138. The device of claim 86, including insulating material, said device being at least partially encased therein.--

-- 139. The device of claim 78, constituting a portion of an internal combustion engine. --

-- 140. The device of claim 79, constituting a portion of an internal combustion engine. --

-- 141. The device of claim 80, constituting a portion of an internal combustion engine. --

-- 142. The device of claim 81, constituting a portion of an internal combustion engine. --

-- 143. The device of claim 82, constituting a portion of an internal combustion engine. --

-- 144. The device of claim 78, wherein said means comprise splines on the interior of the cylinder assembly and meshing complementary splines on the exterior of the component.--

-- 145. The device of claim 79, wherein said means comprise splines on the interior of the cylinder assembly and meshing complementary splines on the exterior of the component.--

-- 146. The device of claim 80, wherein said means comprise splines on the interior of the cylinder assembly and meshing complementary splines on the exterior of the component.--

FIG 397
p 191

FIG 397
p 191

FIG 397

p 191

-- 147. The device of claim 81, wherein said means comprise splines on the interior of the cylinder assembly and meshing complementary splines on the exterior of the component.--

FIG 143

p 100

-- 148. The device of claim 78, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a turbine stage.--

-- 149. The device of claim 79, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a turbine stage.--

-- 150. The device of claim 80, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a turbine stage.--

-- 151. The device of claim 81, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a turbine stage.--

-- 152. The device of claim 82, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a turbine stage.--

FIG 137

pp 99, 219

-- 153. The device of claim 78, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a steam engine stage. --

-- 154. The device of claim 79, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a steam engine stage. --

-- 155. The device of claim 80, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a steam engine stage. --

-- 156. The device of claim 81, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a steam engine stage. --

-- 157. The device of claim 82, constituting a portion of an internal combustion engine which forms a part of a compound engine composed of an internal combustion engine stage and a steam engine stage. --

p 97
-- 158. The device of claim 78, wherein at least part of said component is formed of ceramic material. --

-- 159. The device of claim 79, wherein at least part of said component is formed of ceramic material. --

-- 160. The device of claim 80, wherein at least part of said component is formed of ceramic material. --

-- 161. The device of claim 81, wherein at least part of said component is formed of ceramic material. --

-- 162. The device of claim 82, wherein at least part of said component is formed of ceramic material. --

p 97
-- 163. The device of claim 78, wherein at least part of said cylinder assembly is formed of ceramic material. --

-- 164. The device of claim 79, wherein at least part of said cylinder assembly is formed of ceramic material. --

-- 165. The device of claim 80, wherein at least part of said cylinder assembly is formed of ceramic material. --

-- 166. The device of claim 81, wherein at least part of said cylinder assembly is formed of ceramic material. --

-- 167. The device of claim 82, wherein at least part of said cylinder assembly is formed of ceramic material. --

FIG. 239

pp 124, 125

-- 168. The device of claim 78, wherein at least one of said surfaces of said component and segment define depressions wholly fillable by fluids worked by said device. --

-- 169. The device of claim 79, wherein at least one of said surfaces of said component and segment define depressions wholly fillable by fluids worked by said device. --

-- 170. The device of claim 80, wherein at least one of said surfaces of said component and segment define depressions wholly fillable by fluids worked by said device. --

-- 171. The device of claim 81, wherein at least one of said surfaces of said component and segment define depressions wholly fillable by fluids worked by said device. --

-- 172. The device of claim 82, wherein at least one of said surfaces of said component and segment define depressions wholly fillable by fluids worked by said device. --

-- 173. The device of claim 83, wherein at least one of said surfaces of said component and segment define depressions wholly fillable by fluids worked by said device. --

FIG 400

pp 193, 194

-- 174. The device of claim 78, wherein said means comprise a roller follower on one of said cylinder assembly and component and a guide of endless wave-like configuration on the other of said cylinder assembly and component. --

-- 175. The device of claim 79, wherein said means comprise a roller follower on one of said cylinder assembly and component and a guide of endless wave-like configuration on the other of said cylinder assembly and component. --

-- 176. The device of claim 80, wherein said means comprise a roller follower on one of said cylinder assembly and component and a guide of endless wave-like configuration on the other of said cylinder assembly and component. --

-- 177. The device of claim 81, wherein said means comprise a roller follower on one of said cylinder assembly and component and a guide of endless wave-like configuration on the other of said cylinder assembly and component. --

p178

-- 178. The device of claim 174, wherein said follower is of a truncated conical configuration. --

-- 179. The device of claim 175, wherein said follower is of a truncated conical configuration. --

-- 180. The device of claim 176, wherein said follower is of a truncated conical configuration. --

-- 181. The device of claim 177, wherein said follower is of a truncated conical configuration. --

F-16366

p178

-- 182. The device of claim 174, wherein said follower is dis-engageable from said guide. --

-- 183. The device of claim 175, wherein said follower is dis-engageable from said guide. --

-- 184. The device of claim 176, wherein said follower is dis-engageable from said guide. --

-- 185. The device of claim 177, wherein said follower is dis-engageable from said guide. --

F16 397

p191

-- 186. The device of claim 78, wherein said working chamber is at least partially of torroidal configuration. --

-- 187. The device of claim 79, wherein said working chamber is at least partially of torroidal configuration. --

-- 188. The device of claim 80, wherein said working chamber is at least partially of torroidal configuration. --

-- 189. The device of claim 81, wherein said working chamber is at least partially of torroidal configuration. --

-- 190. The device of claim 82, wherein said working chamber is at least partially of torroidal configuration. --

-- 191. The device of claim 83, wherein said working chamber is at least partially of torroidal configuration. --

p18

-- 192. The device of claim 87, wherein said filamentary material is catalytic to expedite reactions between elements of the working fluids. --

-- 193. The device of claim 88, wherein said filamentary material is catalytic to expedite reactions between elements of the working fluids. --

-- 194. The device of claim 89, wherein said filamentary material is catalytic to expedite reactions between elements of the working fluids. --

-- 195. The device of claim 90, wherein said filamentary material is catalytic to expedite reactions between elements of the working fluids. --

F16S 416-420

pp 201-206

-- 196. The device of claim 78, wherein said component is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 197. The device of claim 79, wherein said component is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 198. The device of claim 80, wherein said component is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 199. The device of claim 81, wherein said component is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 200. The device of claim 82, wherein said component is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 201. The device of claim 83, wherein said component is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

Figs 183, 184, 416-420
pp 102, 201, 202 -- 202. The device of claim 78, wherein said cylinder assembly is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 203. The device of claim 79, wherein said cylinder assembly is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 204. The device of claim 80, wherein said cylinder assembly is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 205. The device of claim 81, wherein said cylinder assembly is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 206. The device of claim 82, wherein said cylinder assembly is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

-- 207. The device of claim 83, wherein said cylinder assembly is comprised of portions and includes at least one element holding said portions together, each said element being pre-loaded under tension. --

REMARKS

Reexamination of this application and reconsideration of the rejection of the claims thereof are respectfully requested under the provisions of Rule 112 for the reasons set forth below.

Claims 59 and 66-68 stand rejected under 35 USC 102(a) on U.S. Patent No. 1,239,728 to Schleppy.

This rejection is respectfully traversed in view of new claims 78, 91, 97, 103, 109, 115, 121, 132, 139, 144, 148, 153, 158, 163, 168, 174, 178, 182, 186, 196 and 202. Claim 78 is claim 66 rewritten. Claims 41, 47, 103, 109, 115, 121, 132, 139, 144, 148, 153, 158, 163, 168, 174, 178, 182, 186, 196 and 202 are all dependent on claim 78. Claim 78 calls for the rotation of the shaft with the component. This rotation of the shaft is not shown in Schleppy.